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CALCUTTA

THE RÔLE OF ANIMAL REMAINS IN THE EARLY PREHISTORIC CULTURES OF INDIA

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INTRODUCTION

THE unfolding of various cultures at different epochs begins rightly from the early stone period when man was a tool-maker. Then the culture passed from primitive to advanced food collecting stages; from the stage of food collection to that of food production and finally to urbanisation through a pastoral and pheasant village life. Civilization could not make its appearance until an effective food production based on farming of plants and animals had come into existence. In the reconstruction of prehistoric farming both animal and plant remains have played an important part. The remains of early man's wild and domestic animals found along with the artifacts and other excavated materials help us to reconstruct the history of domestication, the food habit of the human group in question, and something of their economical and social organisations.

The animal remains found in the excavation also help us to know the geographical, topographical and climatic conditions of the bygone periods. The history of the various types of animals is revealed through the arts and paintings of the prehistoric people and from the actual bony remains. Besides, the animal remains also form valuable dating material.

This article deals briefly the prehistoric animals

found in association with the tools of Stone Age when man was a tool-maker and as well as those revealed by excavations of various prehistoric sites of India and their bearing on Indian culture.

The names of various prehistoric excavations of Archaeological sites which yielded the animal remains along with the remains of human beings have been shown in Text-fig. 1.

The finds of animal remains associated with the Stone Age tools gives us a picture of the pre-domestic condition of animals as well as of the environment and climate of that time.

The remains of animals recorded from the Stone Age tools are exclusively wild, while those of other prehistoric sites indicated in the Text-fig. 1, show matured stages of civilization and domestication of animals with a few exceptions of wild species of Harappa, such as rhinoceros, wolf, wild buffalo and the tiger.

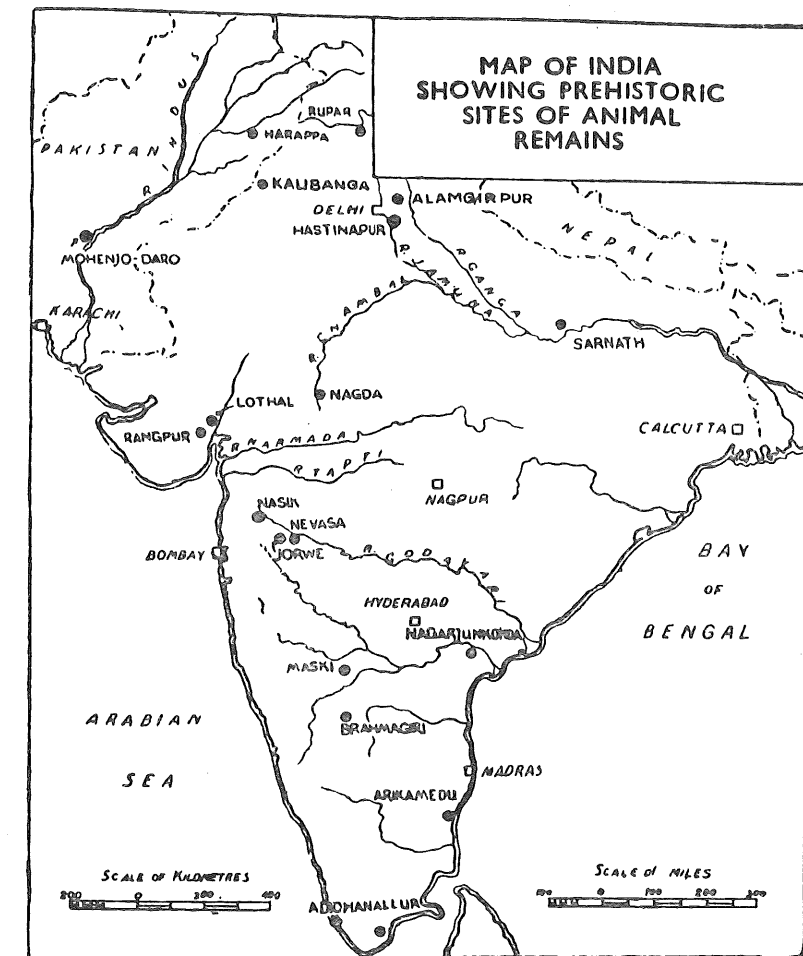
India has been divided into eight broad cultural divisions, e.g. (1) Early Stone Culture (150000—40000 B.C.), (2) Mesolithic or Transitional Cultures (50000—40000 B.C.), (3) Neolithic Culture (2300—1500 B.C.), (4) Indus Culture (2500—1500 B.C.), (5) Chalcolithic-cum-Neolithic Culture (1500—500 B.C.), (6) Gangetic Civilization (1100—200 B.C.), (7) Megalithic Culture of Southern India (200 B.C.

—1st Century A.D.), (8) Buddhist and Early-historic Culture (600 B.C.—400 A.D.).

ANIMAL REMAINS OF STONE AGE OR PALAEOLITHIC CULTURE (150000—50000 B.C.)

The animal remains associated with the Early Stone Age tools, mainly from the Siwalik Hills in the North, the Narbada Valley in the middle, and Madras in the South, are known for the wealth

of animal remains (fossils) and Stone Age tools and are equated with the middle pleistocene. It is characterized by a distinctive fauna—*Elephas*, *Equus* and *Bos*. A middle pleistocene fauna such as *Bos namadicus* Falconer has been associated with it on the Godavari Site in Western India. From the middle pleistocene of Siwalik hills were found the bones of *Elephas namadicus* Falc. & Cautley in the second Himalayan glacial phase,



Text Fig. 1

- (1) Mohenjodaro (Larkana district, Sind, now in West Pakistan), (2) Harappa (Montgomery district, Punjab, now in West Pakistan), (3) Rana Ghundai (North Baluchistan, West Pakistan). (4) Rupar (Ambala district, East Punjab), (5) Rangpur (Gujrat), (6) Hastinapura (Meerut district, U.P.), (7) Maski (Raichur district, Mysore State), (8) Taxilla (West Pakistan), (9) Nasik (Nasik district, Maharashtra), (10) Newasa (N. Deccan, Maharashtra), (11) Brahmagiri (Chitaldrug district, Mysore State), (12) Arikamedu (Pondicherry area), (13) Nagarjunkonda (Andhra Pradesh), (14) Sarnath (Banaras district, U.P.), (15) Kalibanga (Sriganganagar district, Rajasthan), (16) Alamgirpur (Meerut district, U.P.)

while in the third Himalayan glacial phase the bones of horse, wolf, as well as camel and wild ox have been reported (Wheeler, 1939 to 1959). The great Narbada Valley must have been a superb hunting ground for the palaeolithic man. The animal remains found in the basal gravels and sand of Lower Narbada Group are those of *Elephas* sp., *Hexaprotodon namadicus* (wild hippopotamus). The basal gravel and sand of Upper Narbada Group are characterized by the remains of *Bos namadicus* Falc., *Bubalus palaeo-indicus* Falc. & Caut., *Elephas namadicus* Falc. & Caut., *Equus namadicus* Falc. & Caut., *Hippopotamus* sp. and *Sus*, *Trionyx* (a turtle), *Ursus namadicus* Falc. & Caut., *Cervus duvauceli* Cuv., *Rhinoceros unicornis* Linn. The presence of these animals shows that the climate was humid and surrounding country was wooded. This was followed in Western & Central India by another Stone Age known as middle palaeolithic or middle Stone Age or after the type—site—Nevasa—“Nevasian”. The animal remains associated with this culture are *Bos namadicus* Falc., *Elephas antiquus* Falc., rhinoceros, hippopotamus, besides *Cervus duvauceli* Cuv. (swamp deer) showing thereby that the climate at that time was wetter and wooded. A number of caves in which the prehistoric people lived, have been found in the Narbada Valley, on the wall of which paintings of hunting scenes and the fight of men and beasts have been depicted (Pl. I). It is thus evident that it was a period of man's struggle for existence.

ANIMAL REMAINS OF MESOLITHIC OR TRANSITIONAL CULTURE (50000—40000 B.C.)

The small-stone implements called “microlith” has been reported from a number of sites in the last century. This culture has been discovered in Northern Gujrat, Tinnevely in Madras, Mysore and small excavation at Birbhanpur in West Bengal. The animal remains associated with the microlith at Northern & Central Gujrat especially that of Sankalia's well-known site in Gujrat at Langhnaj (Wheeler, 1959, p. 73) included Indian rhinoceros (*Rhinoceros unicornis* Linn.), hog-deer (*Hyelaphus porcinus* Zimm.), Indian wild buffalo (*Bubalus bubalis* Linn.), axis deer (*Axis axis* Erxl.), nilgai antelope (*Boselaphus tragocamelus* Pallas), black-buk (*Antilope cervicapra* Linn.), bovines, mongoose, pig, horse, dog or

wolf, tortoise and fish. All these including the dog and buffalo seem to be wild according to Prof. Zeuner's study without any hint of domestication. The fauna is thus of game, and people were primarily hunters and fishers (besides animal bones remains of fish *vertebrae* & tortoise shells have been found). It thus indicates that economy of the settlement was predominantly that of hunters and food-gatherers.

ANIMAL REMAINS OF NEOLITHIC CULTURE (2300—1500 B.C.)

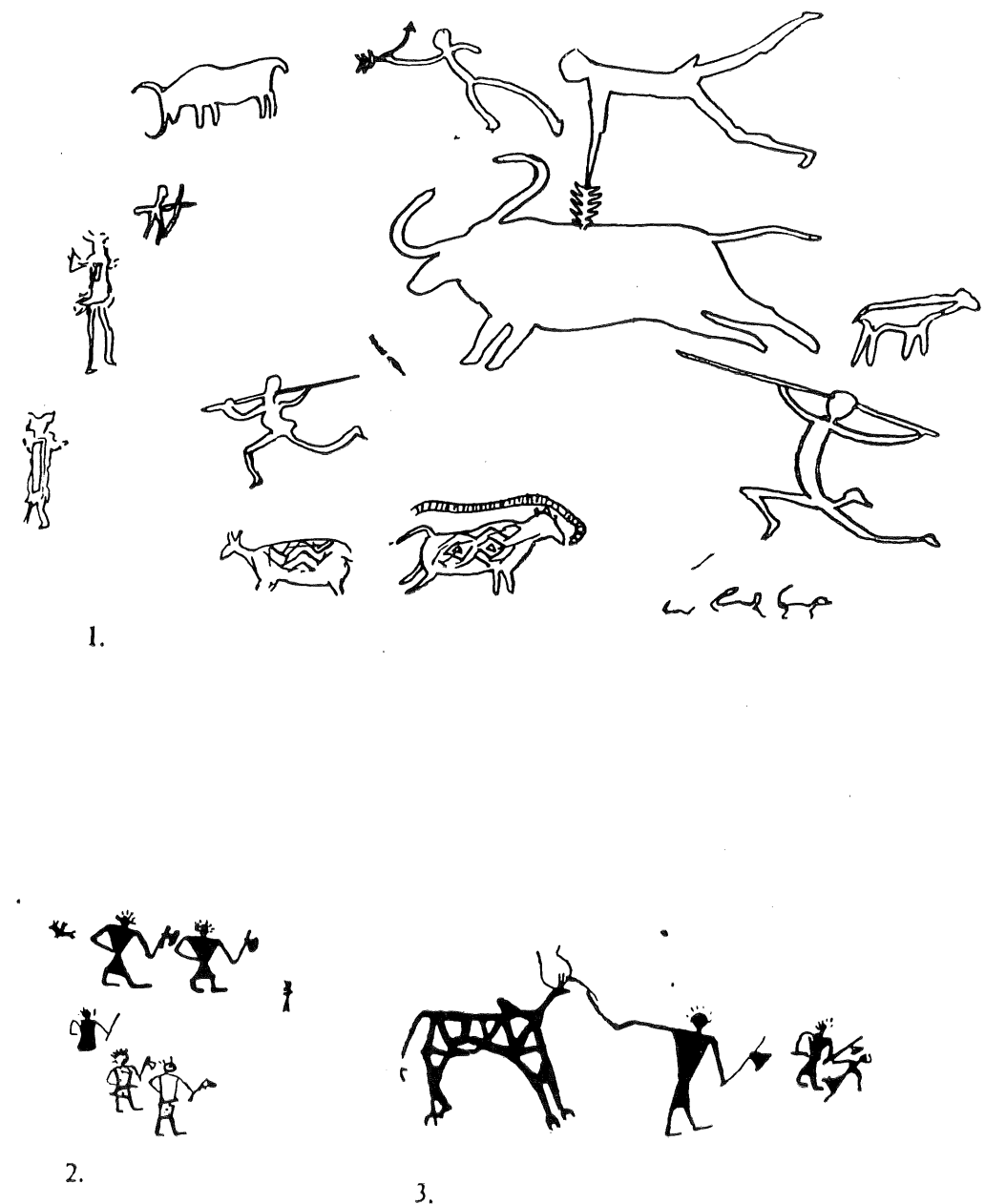
The animal remains from the Burzahom site near Srinagar in Kashmir in Northern India, and Nagarjunakonda in Guntur district, Andhra Pradesh are characterized by the true neolithic pattern of culture.

This culture is characterized by the manufacture of potteries and smooth stone tools and conspicuous by the absence of the metal.

The animal remains excavated from Burzahom, Kashmir, (Nath, unpublished report) has revealed the existence of humped cattle (*Bos indicus* Linn.), buffalo, (*Bubalus bubalis* Linn.), sheep, goat, pig, stag and dog. The remains of three kinds of stags, e.g., the *Barasingha* (*Cervus duvauceli* Cuv.); Kashmir deer (*Cervus hanglu* Wagner) and the sambar (*Rusa unicolor* Kerr.) and at least three breeds of dogs of which dingo-pariah, greyhound and mastiff types are very characteristic. From this it is evident that the people were fond of hunting and hunting was their main occupation besides practicing a primitive type of agriculture.

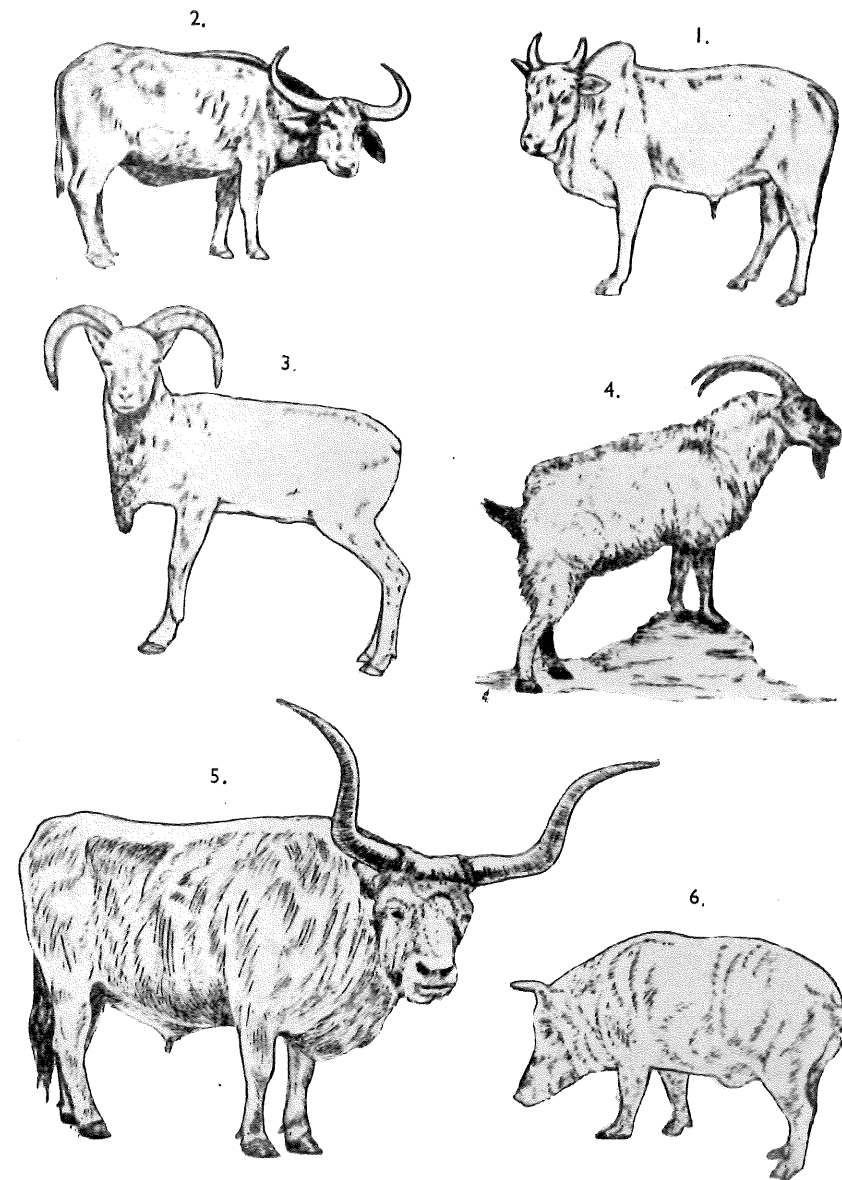
At Nagarjunakonda in Andhra Pradesh, from the neolithic site (Nath, 1968, p. 9) eleven species of animals were found. The remains are mostly of domesticated animals, viz., *Bos indicus* L., *Bubalus bubalis* L., *Ovis vignei* Blyth, *race domesticus* and *Capra hircus aegagrus* Erxl. The absence of pig, *Sus scrofa cristatus* Wagner is rather surprising. Among wild animals, three species of deer, *Cervus unicolor* Kerr., *Cervus duvauceli* Cuv., and *Axis axis* (Erxl.), occur. The remains of black-buck (*Antilope cervicapra* L.), and of the Nilgai (*Boselaphus tragocamelus* Pall.) are also present. The presence of all these animals in the neolithic site suggests that the habitation sites at that time were situated amidst jungles and undulat-

PLATE—I



Hunting scenes depicted on the cave walls of Naramada valley

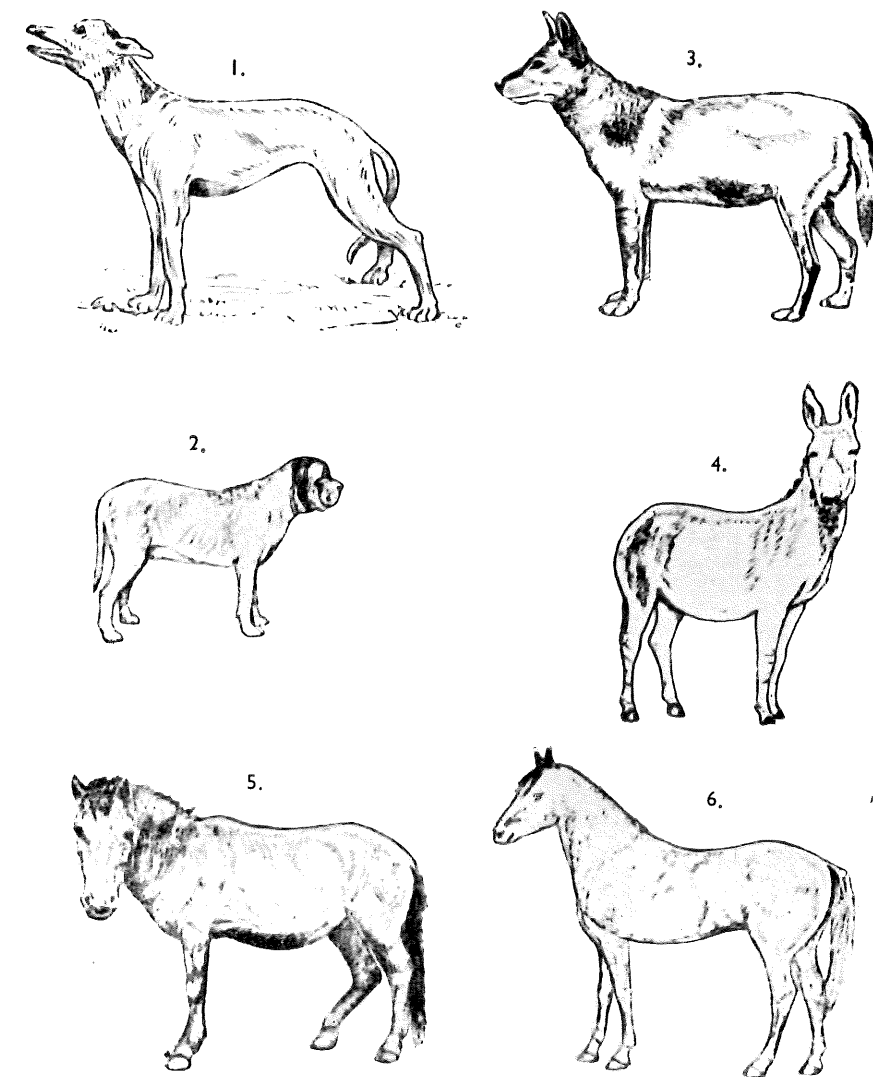
PLATE—II



Sketches of some of the domestic animals of India and other countries.

- FIG. 1. — The zebu or domestic humped cattle of India, *Bos indicus* Linn.
 FIG. 2. — The Indian domestic buffalo, *Bos (Bubalus) bubalis* Linn.
 FIG. 3. — The urial or Punjab wild sheep, *Ovis vignei* Blyth.
 FIG. 4. — The bezoar or wild goat, *Capra hircus* Linn.
 FIG. 5. — The unhumped European cattle, *Bos taurus* Linn.
 FIG. 6. — The Indian wild boar, *Sus scrofa cristatus* Wagner.

PLATE—III



Sketches of some of the domestic animals of India and other countries.

- FIG. 1. — Dog (greyhound).
 FIG. 2. — Dog (mastiff).
 FIG. 3. — The Australian dingo dog, *Canis familiaris dingo* Blum.
 FIG. 4. — The wild ass, *Equus asinus* Linn.
 FIG. 5. — The Mongolian wild horse, *Equus caballus przewalskii* Poliakov.
 FIG. 6. — The Arabian horse, *Equus caballus* Linn.

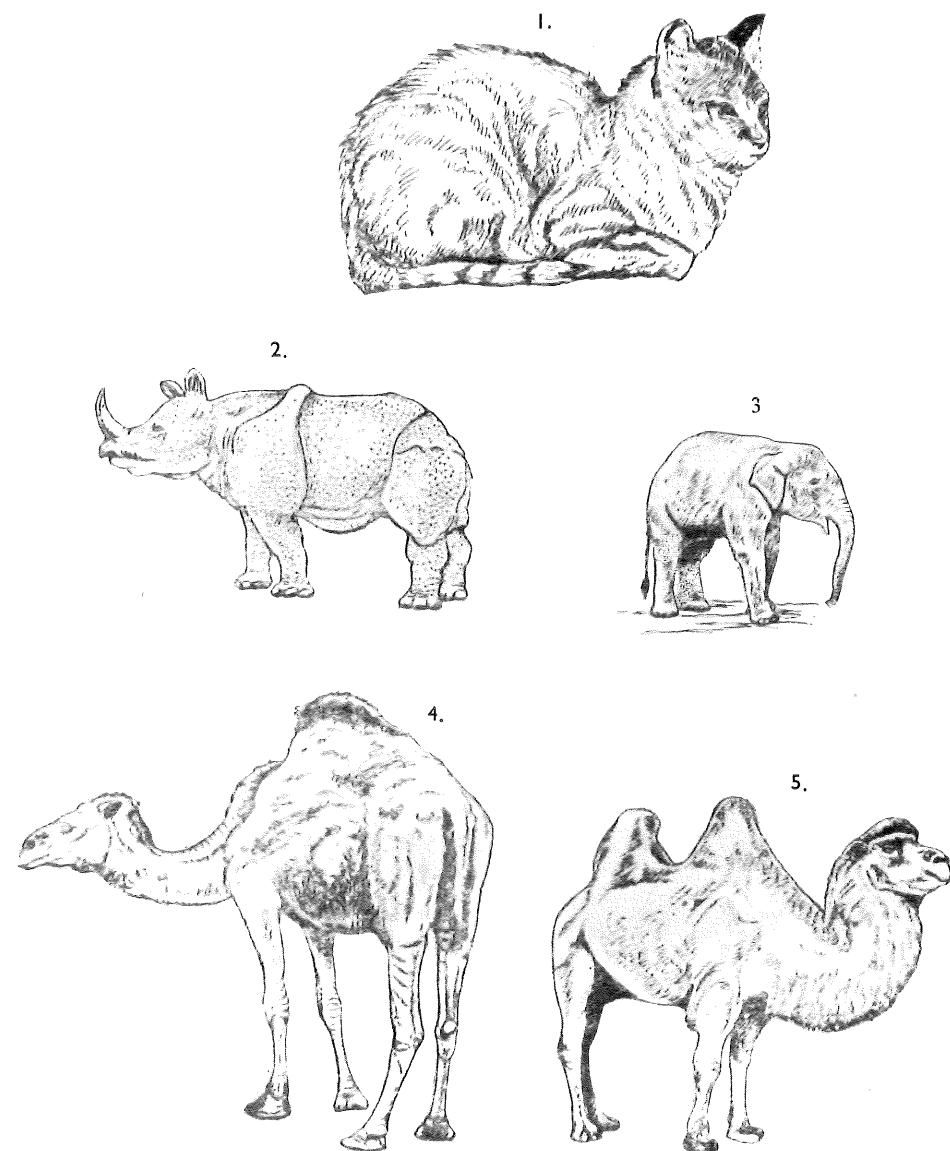


FIG. 1.—The domestic cat, *Felis domestica* Linn.
 FIG. 2.—The Indian One-horned rhinoceros, *Rhinoceros unicornis* Linn.
 FIG. 3.—The Indian Elephant, *Elephas maximus* Linn.
 FIG. 4.—The dromedary or one-humped camel, *Camelus dromedarius* Linn.
 FIG. 5.—The Bactrian or two-humped camel, *Camelus bactrianus* Linn.

ing land, and the settlers were practising pastoral economy tending towards food growing.

ANIMAL REMAINS OF INDUS CULTURE (2500—1500 B.C.)

The earliest prehistoric culture of India was the Indus Culture. The animal remains obtained from the excavations at Mohenjodaro (Sewell & Guha, 1931), Harappa (Prashad, 1936), Rupar I (Nath, 1968), and Rangpur I (Nath, 1963), and Lothal (unpublished) belong to the Indus Culture. This culture covers the largest area of any other pre-classical civilization of India and extended from north-western part of India, comprising Baluchistan, Makran, and Sind, Bahawalpur, Punjab and eastward in Bikaner, Kalibanga in Sriganganagar district, Rajasthan, Rupar (E. Punjab) and Alamgirpur in Meerut district, U.P., and in the south upto Rangpur and Lothal in Gujrat.

The culture counted amongst its achievements a representational art which concerns itself largely with animals and natural forms; and these representations of the contemporary wild and domesticated animals are amplified by the actual remains of the animal bones recovered from the excavations. (Pls. VI—VIII). From these we see that the climatic conditions of the Punjab were such as to favour a suitable habitat for the rhinoceros, the wolf and the tiger as well as the water buffalo (*Bos bubalis* Linn.) and the elephant (*Elephas maximus* Linn.), none of which survives as wild species in the region today (except the tiger which is sometimes found in Sind). Bony remains of all the above animals, except the tiger, have in fact been found at either Mohenjodaro or Harappa. Among other wild animals known from one or both of these sources we may mention the river crocodile of the gharial type, *Gavialis gangeticus* (Gmelin), still an inhabitant of the Indus; the barasingha deer (*Cervus duvauceli* Cuv.) at least. Further, the horns of the Kashmir deer (*Cervus hanglu* Wagner), spotted deer (*Axis axis* Erxl.), sambar (*Rusa unicolor* Kerr.), and hog deer (*Axis porcinus* Zimm.) have been found which show that they were imported from outside for medicinal purposes according to Sewell & Guha (1931, p. 671).

The presence of charred or burnt bones of a number of other aquatic animals such as the

gharial, (*Gavialis gangeticus* Gmelin), and some turtles, e.g., *Geoclemys hamiltoni* (Gray), *Kachuga tectum*, *Chitra indica* (Gray), *Trionyx gangeticus* Cuv., *Lissemys punctata* (Bonn.), etc., indicates that they were probably an ingredient of the food of the inhabitants. The remains of the jackal and the wolf were found not far from the edges of town; rats (*Rattus rattus* Linn.); gerbills (*Tatera indica* Hardw.), the mongoose (*Herpestes auro-punctatus* Hodgson), the lizard (*Varanus* sp.), and the tortoise must have been familiar to the inhabitants at Harappa and Mohenjodaro. The river nearby supplied the carp and also *Rita rita* (Ham. Buch.) and *Wallago* sp. both freshwater fishes, besides a fish of the genus *Arius* which is found in the seas and estuaries of tropical regions. All the three fishes viz., *Rita rita*, *Wallago* sp. and the carp bones, are with cut marks on them, signifying that they were used as food.

A large number of shells (Sewell & Guha, 1931, p. 670) were also imported for use as ornaments. These shells included *Lamellidens marginalis* (Lama.) (a fresh water mussel), *Arca granosa* Linn. (the marine arkshell), *Arabica arabica* (Linn.) (a cowry), *Babylonia spirata* (Linn.) (a marine gastropod mollusc), *Xancus pyrum* var. and *acuta* Hornell var., *fuscus* Sowerby (the shank shells), *Fasciolaria trapezium* (Linn.) (a marine gastropod shell), *Viviparus bengalensis* (Lamarck) (the banded pond-snail) and *Indoplanorbis exustus* (Deshayes). Apart from food, it is certain that the shells were used for ornaments. Except *Lamellidens marginalis* all other species can, without doubt, be said to have been brought from the sea-coast and this indicates that a regular trade was carried on between Mohenjodaro and the sea-coast peoples (Sewell & Guha, 1931, p. 670). In addition to the bangles or their fragments which have been excavated, the presence of a number of cores from which bangles have been sawn shows clearly that Mohenjodaro (Sewell & Guha, 1931, p. 671) was a centre of bangle making industry.

The domestic animals (Pls. II—IV) in the Indus Culture include: the Indian humped cattle (*Bos indicus* Linn.) of which two distinct types have been distinguished from Harappa: (i) a large massive form, probably of the type of long-horned humped cattle; and (ii) a small form with

short horns and other such as the Indian domestic buffalo (*Bubalus bubalis* Linn.), the goat (*Capra hircus aegargus* Erxl.), the sheep (*Ovis vignei* Blyth *race domesticus*), the pig (*Sus cristatus* Wagner), the one-humped camel (*Camelus dromedarius* Linn.), the domestic dog (*Canis familiaris* Linn.), the Indian elephant (*Elephant maximus* Linn.), the fowl (*Gallus* sp.) and the domestic ass (*Equus asinus* Linn.), and, at a later period the horse (*Equus caballus* Linn.).

The goat (Piggot, 1950, p. 156) appears to belong to the same group as those of Kashmir which produces superb wool and so the possibility of goat-wool being used in the Indus Culture must be borne in mind. The sheep, probably domesticated from the wild Urial stock, seem likely to belong to a long-legged, long-tailed race which include various wool-producing forms. The pigs belong to the lean, brisk bristly species known in India today. There is evidence of the domestication of the dog (Piggot, 1950, p. 156) from the earliest days of the Indus Culture. The evidence of bones and representations from Indus sites show at least three types of dog, the one akin to the modern Dingo-pariah, the other a greyhound type, and the third a mastiff type. The only remains of dog from Harappa are of greyhound type with elongated snout, which has been designated as *Canis tenggeranus*, var. *harappensis* Prashad, the relationship of which has been indicated by Prashad's (1936, p. 23) comparison with *C. tenggeranus*, which is said to be found in pleistocene deposit in oriental countries. The name, however, is that of the Javanese pariahs, the skull of which suggest affinity with Indian wolf (*Canis indicus lupus*).

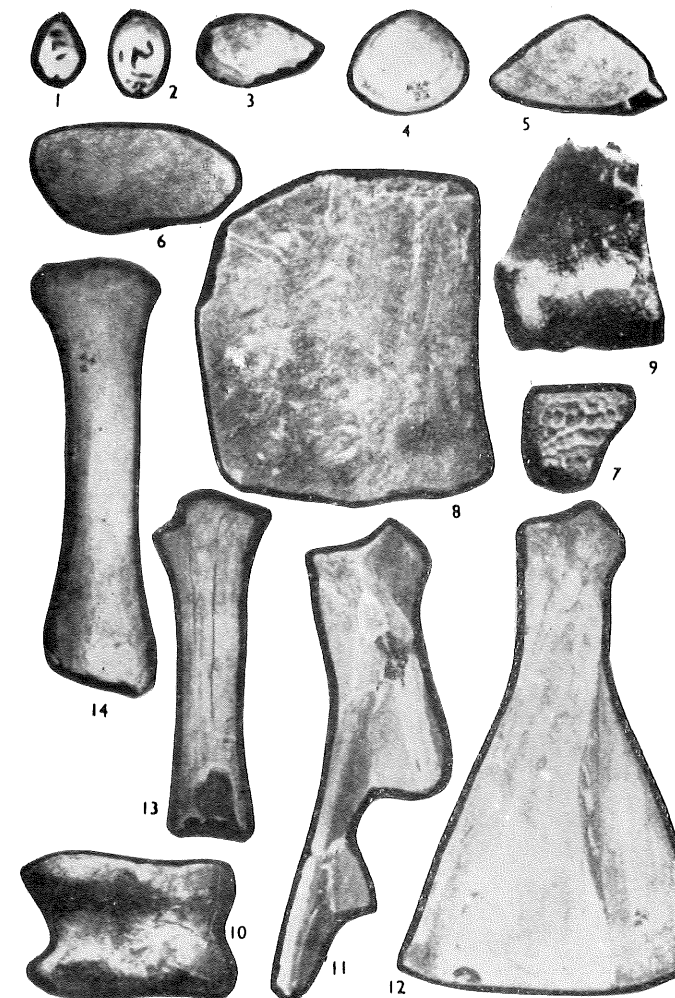
There is very interesting evidence of domesticated cats (Piggot, 1950, p. 156) as well as bones from Harappa. The cat from Harappa seems to have closely resembled the ordinary European domestic cat in appearance. Only a few bones of the one-humped camel have been found at Harappa (Prashad, 1936, p. 59) and Mohenjodaro (Sewell & Guha, 1931, p. 660). This species has not so far been discovered in a wild state and is known only in domesticated form. The domestic ass and the horse are both represented at a later period. Finally, the elephant (Piggot, 1950, p. 157) should be included amongst those animals which

were almost certainly domesticated by the Indus people. Its representations on seals show two breeds recognised today in India, viz., (i) the Komooru Dhundia breed with its flat back, square head and stout legs; and (ii) the inferior Meergha breed which is less heavily built and has a sloping back. Ivory was freely used and ivory-working was an Indus craft. A few bony fragments of the domestic fowl (*Gallus* sp.) obtained at Harappa, Mohenjodaro and Rupar show close resemblance with the bones of the domestic fowl found at present. The Mohenjodaro finds, however, far exceed in size than those of Harappa and the modern species, and it is doubtful whether the inhabitants of Mohenjodaro were acquainted with the domestic fowl.

Numerous figures of animals, mostly in terracotta (Pl. IX, figs. 1 & 2), such as those of humped bull, dog, sheep, elephant, rhinoceros, pig, turtle and indeterminate birds have been found in houses of Mohenjodaro. Harappa terracotta models show that the two-wheeled ox-cart was familiar to the Harappans (Wheeler, 1953, p. 62). Many of those have their parallels sculptured on seals (Pl. IX, fig. 3), among them the Brahmani bull or zebu with hump and heavy dewlap occurs fairly abundantly with its pronounced muscularity and dignified stance, along with the representation of other animals such as tiger, buffalo, rhinoceros, elephant, sheep, goat, etc. Representations of seals prove a close knowledge of animals by the people, apart from the skeletons actually found. All this shows that the people were well acquainted with these animals and they actually formed a part in the cultural life of the people.

All the species of animals recorded from Rupar I (Nath, 1968, pp. 69-115) and Rangpur I (Nath, 1963, pp. 153-160) are identical with those of Harappa and Mohenjodaro and belong to the Harappan Culture. A few cut-marks on the bones particularly of the humped cattle (*Bos indicus* Linn.), buffalo (*Bubalus bubalis* Linn.), sheep (*Ovis vignei* Blyth), goat (*Capra hircus aegargus* Erxl.) and pig (*Sus scrofa cristatus* Wagner) at Rupar and Rangpur indicate the probable use of these animals as food. The find at Rupar of the black partridge (*Francolinus francolinus* Linn.) besides that of the fowl shows that the inhabitants were well acquainted with these birds,

PLATE—V



Skeletal remains of some animals from ancient site of Sarnath excavation (1200 A.D.) together with skeletons of recent forms in the collection of the Zoological Survey of India. (After B. Nath, 1958), *J. Zool. Soc. India*, Vol. 10 (No. 2), pp. 165-175.

Monetaria monata Linn.
(The Money Cowry)

FIG. 1.—One shell of cowry. No. 215. Excavated at Sarnath.

Cypraea pallida Gray.
FIG. 2.—One shell of a cowry. No. 215. Excavated at Sarnath.

Parreyssia sp.
FIG. 3.—Fragment of a valve. No. 215. Excavated at Sarnath.

Parreyssia favioens (Benson). No. 3689. Excavated at Harappa.
Lissemys punctata (Bonn.) forma typica.

FIG. 4.—Right valve of *Parreyssia favioens* (Benson). No. 3689. Excavated at Harappa.

FIG. 5.—Fragment of a epiplastron. No. 11/1943. Excavated at Sarnath.

FIG. 6.—Left complete and intact epiplastron from Harappa. No. 5556.

Chitra indica (Gray).
FIG. 7.—Fragment of hypoplastron. Area of antiquity No. 49. Excavated at Sarnath.

Batagur baska (Gray).
FIG. 8.—Dorsal view of the fragment of a plastron *Batagur baska* Gray. Area of Antiquity No. 49. Excavated at Sarnath.

Bos indicus Linn.
FIG. 9.—Fragment of the left distal humerus. No. 13/1943. Excavated at Sarnath.

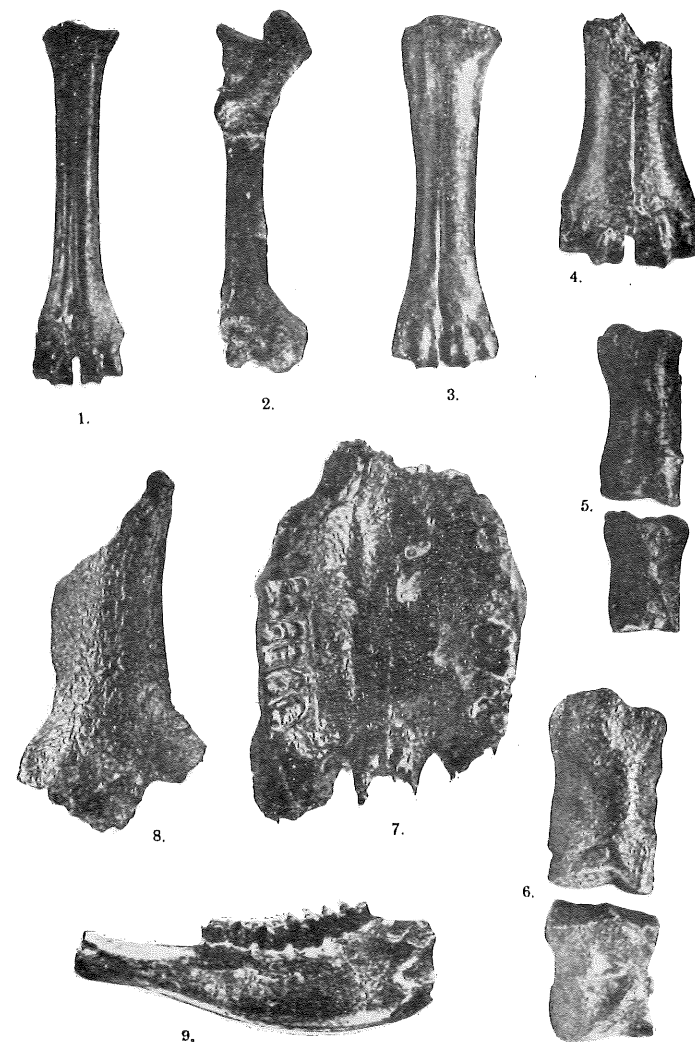
FIG. 10.—Left astragalus of an young one. No. 116. Excavated at Sarnath.

Bubalus bubalis (Linn.).
FIG. 11.—Fragment of the left scapula. No. 719/28. Excavated at Sarnath.

FIG. 12.—Left scapula of a modern specimen in the Zoological Survey of India.

FIG. 13.—Proximal fragment of the left radius. No. 166/28. Excavated at Sarnath.

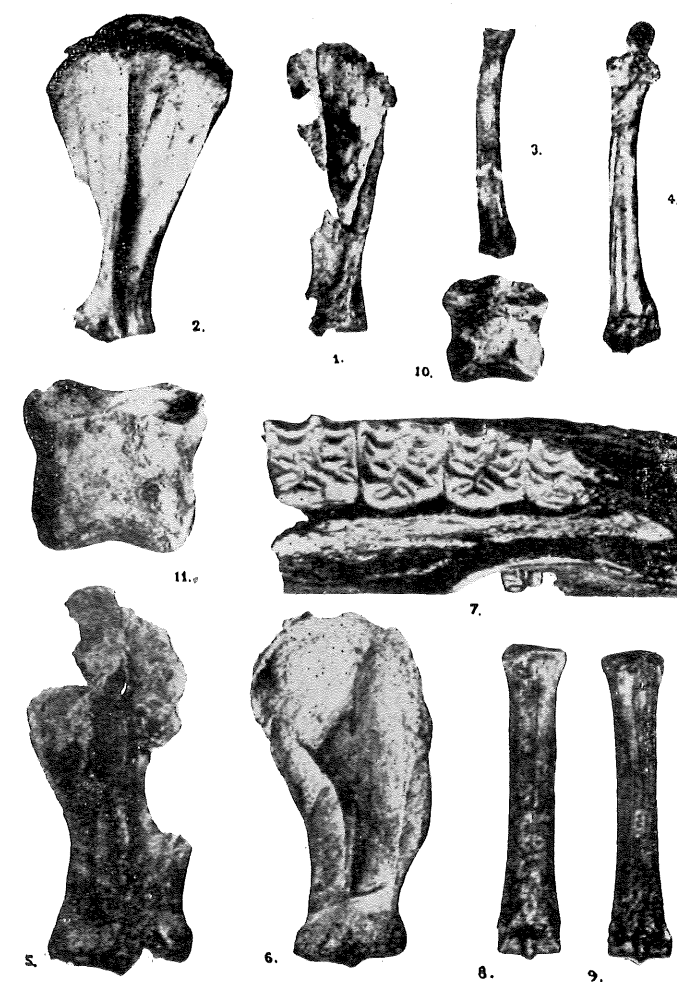
FIG. 14.—Left radius of a modern specimen in the Zoological Survey of India.



Skeletal remains of some animals from Harappa excavation (Ca. 2500—1500 B.C.) in the collection of the Zoological Survey of India (After B. Prashad, 1936, *Mem. Archaeol. Surv. of India*, No. 51).

Bos indicus Linn.

- Fig. 1. —Left 3rd and 4th metacarpal of an animal of short-horned race. No. H/C, Cemetery site, Harappa.
 Fig. 2. —Right femur of an animal of the long-horned race. No. 10212, Harappa.
 Figs. 3. & 4.—Complete and distal fragment of 3rd-4th metatarsal of short and long-horned races. No. 10212 and from Mound F, Trench VI, respectively Harappa.
 Figs. 5. & 6.—1st and 2nd phalanges of the short and long-horned races. No. 10212 and from Mound F, Trench VI, respectively Harappa.
Bubalus bubalis (Linn.).
 Fig. 7. —Palatal part of a specimen No. G 11/27, Harappa.
 Fig. 8. —Fragment of a right horn from Mound G; Trench II, square A.M. 40/21, Harappa.
 Fig. 9. —Fragment of left ramus of lower jaw. No. 5440 a, b, c. Harappa.



Skeletal remains of some animals from Harappa excavation (Ca. 2500—1500 B.C.) together with skeletons of recent forms in the collection of the Zoological Survey of India (After B. Prashad, 1963, *Mem. Archaeol. Surv. India*, No. 51).

Camelus dromedarius Linn.

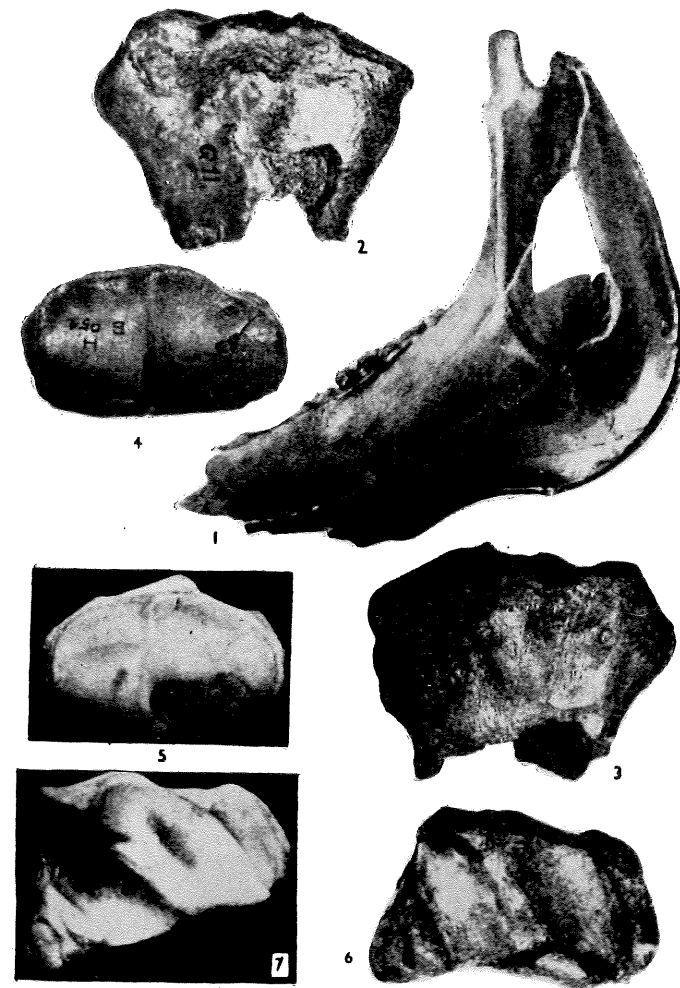
- Fig. 1. —Left scapula. No. 954 fragmentary. Harappa.
 Fig. 2. —Left scapula of a recent specimen in the Zoological Survey of India.
 Fig. 3. —Left radio-ulnar shaft from Mound AB, excavated from a depth of 8'-7"-11'-10". Harappa.
 Fig. 4. —Left radio-ulna of a recent specimen in the Indian Museum.

Rhinoceros Unicornis Linn.

- Fig. 5. —Fragmentary right scapula from Mound F, excavated from a depth of 8'-7"-11'-10". Harappa.
 Fig. 6. —Right scapula of a specimen in the Zoological Survey of India.

Equus asinus Linn.

- Fig. 7. —Maxillary portion of palate with 4th promolar and 1-3 molars, No. 954. Harappa.
 Figs. 8. & 9.—Two 3rd right metacarpals.
 Figs. 10. & 11.—Two specimens of 2nd phalanx of right hind-leg and right fore-leg of different sizes (D.R.S. Colln.) No. D.S. 40 and 29.



Skeletal remains of horse from Harappa excavation (Ca. 3,500—1,500 B.C.) together with skeletons of recent forms in the collection of the Zoological Survey of India (After B. Nath, 1962, *Proc. 1st All India Congress of Zoology*, 1959, Part 2. Scientific Papers, Plate I).

- Fig. 1. — Left ramus of mandible without body No. G. 289. Harappa.
- Fig. 2. — Dorsal view of left proximal extremity of radius. No. G. 11. Harappa.
- Fig. 3. — Volar view of left proximal extremity of radius. No. G. 11. Harappa.
- Fig. 4. — Distal articular extremity of left radius. No. G. 11. Harappa.
- Fig. 5. — Distal articular extremity of left radius of a modern horse in the Zoological Survey of India.
- Fig. 6. — Distal articular extremity of right tibia. No. G. 11. Harappa.
- Fig. 7. — Distal articular extremity of a modern horse in the Zoological Survey of India.

The recent excavations at Kalibangan (Nath, unpublished report), in district Sriganaganagar, Rajasthan has revealed the existence of large number of animal remains of Harappan culture. Amongst domestic animals the *Bos indicus* Linn. of which two distinct types have been distinguished from Kalibangan: (i) a large massive form of long-horned humped cattle, (ii) a small form with short horn, and others such as Indian domestic buffalo, the goat, the sheep, the pig, the dog, the Indian elephant, the fowl, and the domestic ass (*Equus anager*).

Amongst wild animals rhinoceros (*Rhinoceros unicornis* L.) and shells of turtles, the Barasingha deer, Sambar, and spotted deer's remains have been found.

The remains of these animals show that the climate at that time was more humid than the arid climate of present days. The large number of domestic animals recovered from the excavations show that the people were pastoral-cum-agricultural. The animal remains from Kalibanga are similar in number and kinds with those from Harappa & Mohenjodaro.

ANIMAL REMAINS OF THE CHALCOLITHIC-CUM-NEOLITHIC CULTURES OF WESTERN AND SOUTHERN INDIA (1500—500 B.C.)

This culture is applied to copper and bronze-using communities which retain a substantial though subordinate stone equipment. In the Deccan this culture has been identified at Brahmagiri, Maski, Daimabad, Nagada, Nevasa, Jorwe and Nasik. In these regions, despite local variations, the culture is broadly homogenous in its assemblage.

Period I of Maski was Chalcolithic in nature. The animal remains (Nath, 1957, pp. 111-120) revealed the existence of the freshwater mussels (*Parrysia* sp.) and *Viviparus bengalensis* (Lamarck) amongst the invertebrates, and the common rat (*Rattus rattus* Linn.), short-horned humpless cattle (*Bos indicus* Linn.), buffalo (*Bos bubalis* Linn.), sheep (*Ovis vignei* Blyth), and goat (*Capra hircus aegagrus* Linn.) amongst the vertebrates. Of the latter division a large number relate to the short-horned cattle and the sheep of which obviously bigger herds had been maintained. The domestica-

tion of these animals indicates a pastoral economy of the settlers tending towards food growing.

Phase I of Brahmagiri (Nath, 1968, p. 86) was also chalcolithic in nature. The animal remains revealed the existence of the humped cattle, buffalo, sheep, goat, pig, dog and hare (*Lepus nigrocollis* Cuv.). Few fragments of bones of the chital deer (*Axis axis* Erxl.) have also been found. The majority of the animal remains are domesticated, that of *Bos indicus* Linn., being by far the most predominant. The remains of goat and sheep (*Ovis vignei* Blyth race *domesticus*) are fairly common. The pig (*Sus scrofa cristatus* Wagner) is very scantily represented. The presence of the bone of the chital (*Axis axis* Erxl.) shows that the surrounding countryside was, under natural condition, a jungle. Phase I of the chalcolithic Brahmagiri reflects an essentially pastoral and static food producing economy of the settlers.

The Daimabad (Nath, unpublished report), in Aurangabad district, Maharashtra another chalcolithic-cum-neolithic site has revealed the existence of domestic humped cattle (*Bos indicus* Linn.), buffalo (*Bubalus bubalis* Linn.), sheep, goat, pig, dog and domestic cat (*Felis catus* Linn.). Besides remains of spotted deer (*Axis axis* Erxl.) has been found. Thus the chalcolithic Daimabad reflects an essentially pastoral and static food producing economy of settlers like that of Brahmagiri.

Period I of Nagada (Nath, 1966, p. 188) was also chalcolithic in nature. The animal remains are mainly represented by domestic cattle (*Bos indicus* Linn.), buffalo (*Bos bubalis* Linn.), sheep, goat and the wild chital or spotted deer (*Axis axis* Erxl.). The domestication of these animals demonstrates the pastoral economy of the settlers like that of the Maski.

At Nevasa (Eapen, 1960, pp. 531-536) the animal remains of the chalcolithic period are mainly represented by the domestic cattle (*Bos indicus* Linn.) and the wild Barasingha (*Cervus duvaucelli* Cuv.). Remains of the goat (*Capra hircus aegagrus* Erxl.) and turtle (*Chitra indica* Gray) are less numerous. Few fragments of bones of other variety of deer (*Axis axis* Erxl.) and rat (*Rattus rattus* Linn.) have been found. The absence of pig is surprising. A number of shells have been found at Nevasa (Ray, 1960, pp. 539-

550) of which some had been used in the chalcolithic period for ceremonial purposes such as the shank shell (*Xancus pyrum* Linn.), some for ornaments (*Monateria monata* Linn. and *Viviparus bengalensis* Lam.) and some as spoons such as *Lamellidens marginallis* (Linn.) and *Parreysia favidens* (Benson).

Jorwe and Nasik (George, 1965, pp. 142-143) are also chalcolithic in nature. The species represented here by animal remains are: domestic humped cattle, buffalo, sheep, goat, nilgai (*Boselaphus tragocamelus* Pallas), and the common rat. Besides these, three members of deer family, viz., Chittal (*Axis axis* Erxl.), Sambar (*Rusa unicolor* Kerr.) and four-horned antelope (*Teraceros quadricornis* Blainville), are represented. The find of the langur (*Semnopithecus* sp.) is also interesting. The reptile remains are mainly of the turtle, *Trionyx* sp. The demonstration of these animals reveals a pastoral economy tending towards food-growing.

ANIMALS IN GANGES CULTURE (1100—200 B.C.)

The prehistoric sites excavated in the Ganges valley during the first millennium B.C., belong to the Ganges Civilization. This culture has been divided into two distinct subcultures, viz., (i) Painted Grey Ware Culture (1100—800 B.C.), (ii) Northern Black Polished Ware Culture (600—200 B.C.).

ANIMALS OF PAINTED GREY WARE CULTURE (1100—800 B.C.)

The animal remains of the Period II, Hastinapur (Nath, 1955, pp. 107-120) belong to Painted Grey Ware Culture. A study of animal remains throws light on the economy and food habits of the people during this period. Humped cattle (*Bos indicus*) is represented in terracotta. The occurrence of charred bones of the humped cattle, buffalo, sheep and pig etc. bearing cut-marks on them show that these animals were slaughtered for food. Bones of the humped cattle and buffalo obtained in large numbers show that the cattle-breeding formed an important occupation of the people. During Painted Grey Ware period, maintenance of herd of cattle was expected. People seem to have been fond of hunting deer whose bones were frequently used for making style and other decorative objects. The occurrence of the horse (*Equus caballus* Linn.) during the Painted Grey Ware Period is significant as it played an

important part in the everyday life of the early Aryans.

The animal remains of the Period II of Rupar (Nath, 1968) also belong to the Painted Grey Ware Culture. The domesticated animals included were: the humped cattle, buffalo, sheep, goat, pig, domestic ass, dog, fowl (*Gallus* sp.) black partridge (*Francolinus francolinus* Linn.), and a river turtle (*Trionyx gangeticus* Cuv.). The demonstration of these animals reflects an essentially food-producing economy of the inhabitants of those times. Iron appeared during the last phase of this culture and was sporadically used (Wheeler, 1959, p. 130).

ANIMALS OF THE NORTHERN BLACK POLISHED WARE CULTURE (600—200 B.C.)

The animals of Period III of Rupar (Nath, 1968, p. 69) and Hastinapura (Nath, 1955, pp. 107-120) belong to this culture. In this period iron was regularly used for the first time (Wheeler, 1959, p. 131). At Hastinapura, square and round coins came into use during this period. The domesticated animals included the humped cattle, buffalo, sheep, goat, pig, domestic ass, horse, elephant and fowl (*Gallus* sp.). Besides these, the river turtles, viz., *Chitra indica* (Gray) and *Trionyx gangeticus* Cuv., and one species of deer (chital), (*Axis axis* Erxl.) are also represented. Terracotta figurines of animals, especially the elephant, are better modelled than in the preceding period. The demonstration of these animals also reflect an essentially food-producing economy of the inhabitants based primarily on agriculture; and trade became a significant feature.

ANIMALS OF THE MEGALITHIC CULTURE OF SOUTHERN INDIA (300 B.C.—1st Century A.D.)

Megaliths abound in Southern India. They are burial tombs in which large-size stones were variously used. The simplest form of megalith is a stone circle holding together a low mound. Others are the dolmenoid and slabbed cists found within the stone circles. The dolmenoid cist is found above the ground built of unhewn stone boulders covered with capsule. The eastern upright stone is occasionally pierced with a "post-hole". The slabbed cist is found sunk to half their height below the surface within the stone circle, the eastern slab of which is pierced with a "port-hole", through which skeletons and other offerings

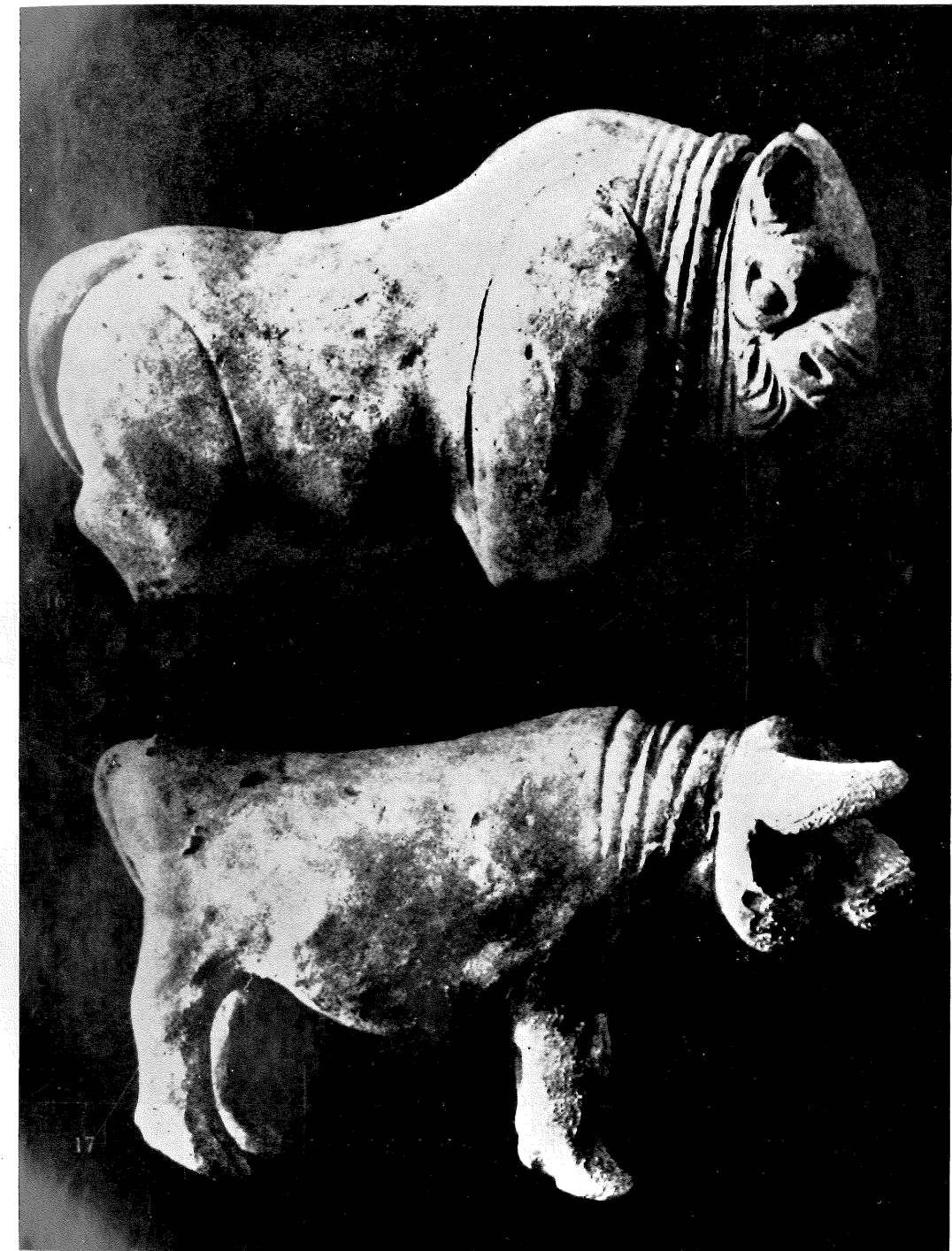


Fig. 1. — Mohenjodaro: terracotta bull (After Wheeler, 1950)
Fig. 2. — Mohenjodaro: terracotta buffalo (After Wheeler, 1950)



Fig. 3. — Mohenjodaro: Steatite seals depicting animal figurines.



Fig. 1. — Terracotta sarcophagus from Sankhavaram, Chingleput district, now in Madras Museum. After Wheeler, 1950.

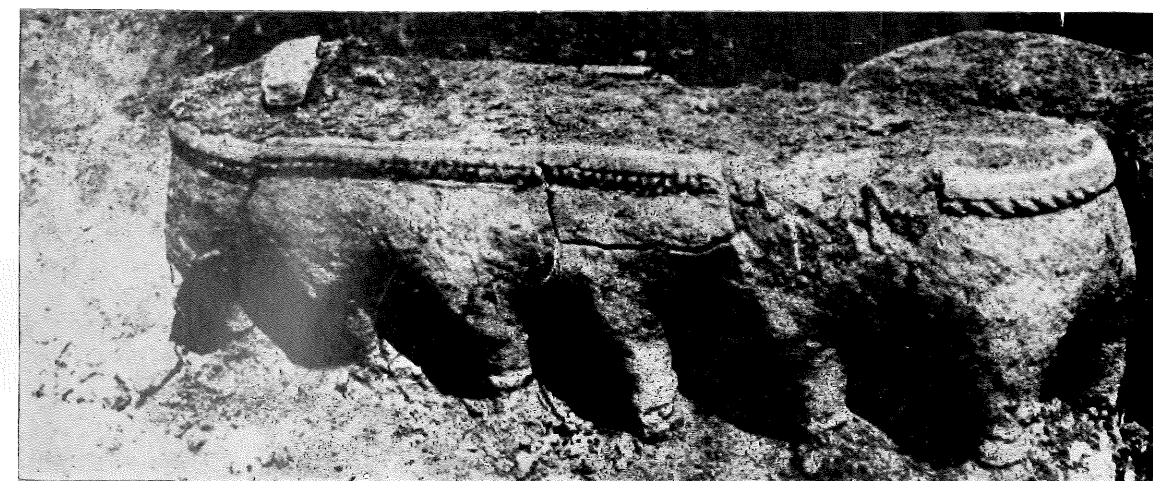
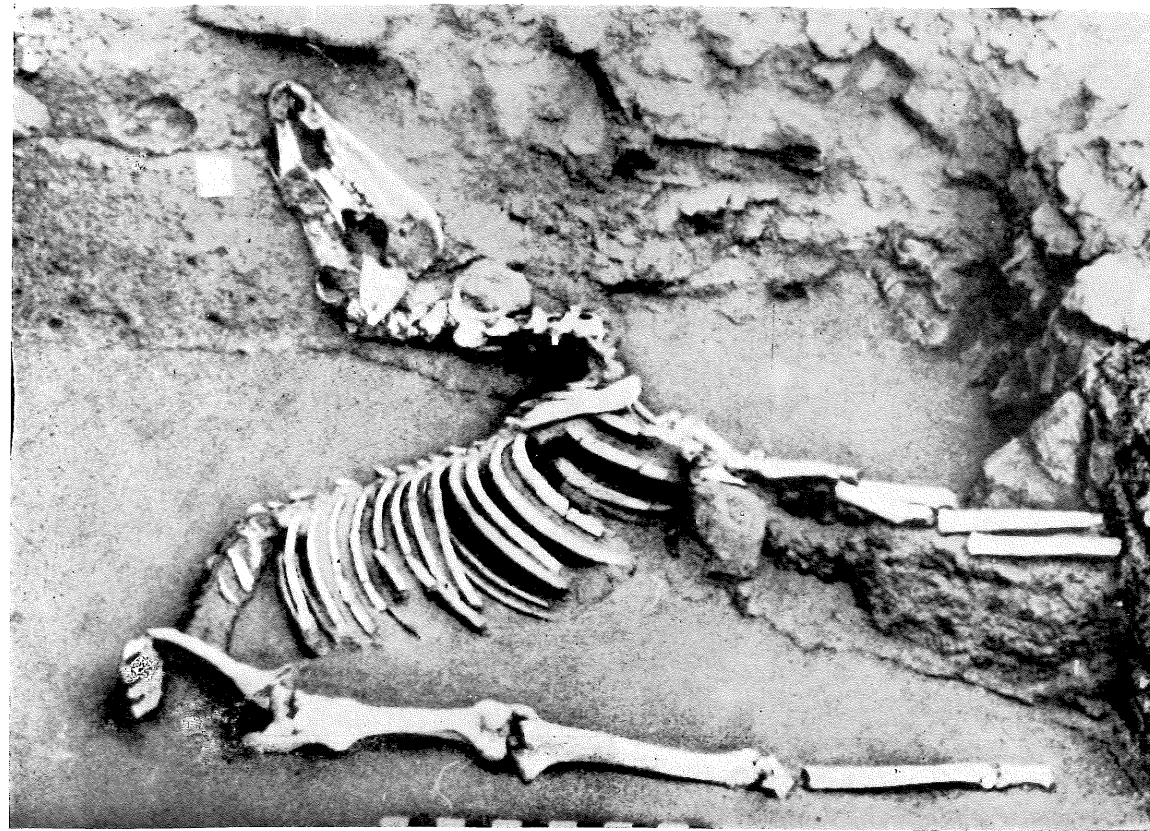


Fig. 2. — Terracotta sarcophagus at Pallavaram, Chingleput district. After Wheeler, 1950.



Skeleton of an Equid (Pony) — *Equus caballus* Linn. from Aśvamedha Site, Nagarjunakonda, Andhra Pradesh.

were inserted. Megaliths (Wheeler, 1959, p. 153) particularly post-hole cists, are widespread in Southern India. The stone circle entombs urns in single or multiples, and occasionally sarcophagi and also pits. Both dolmenoid cist and slabbed cist (Wheeler, 1959, p. 154) enclose sarcophagi. Megaliths are known from Maski, Sanur, Brahmagiri and Nagarjunakonda (Andhra Pradesh).

At Maski the animal remains of sheep (*Ovis vignei* Blyth) were obtained from Pit 28 to megalithic burial of class B (i) and class B (ii), along with human remains. A bone of the domestic ass (*Equus asinus* Linn.) was also obtained from a superficial deposit with the menhir (Menhir is an erect single standing stone raised in honour of the dead). It was perhaps the belief of the people that the soul or virtue of the dead man would stick to the stones or posts and benefit the survivors and the village crop. At Sanur (Bose, 1959, p. 42) disarticulated human and animal remains were found from the Megalith 5. The species represented by animal bones are: *Bos indicus*, *Ovis vignei*, *Capra* sp., the wolf or hyaena, and *Gallus* sp. The animal remains obtained at Brahmagiri (Nath, 1968) from the megalith burials belong to the humped cattle, buffalo, sheep, goat, pig, dog and a fowl (*Gallus* sp.). The recent excavations of the megalithic sites at Nagarjunakonda in Andhra Pradesh (Nath, 1968, p. 9) have revealed the existence of bones of humped cattle (*Bos indicus* Linn.), buffalo (*Bos bubalis* Linn.), sheep (*Ovis vignei* blyth race *domesticus*), goat (*Capra hircus aegagrus* Erxl.), and pig (*Sus scrofa cristatus* Wagner). In Chingleput (Madras) region where the cists (Wheeler, 1959, p. 154) are best known, they are liable to include one or more and sometimes as many as five, terracotta legged sarcophagi, with pots and iron objects. A sarcophagus (Pl. X, fig. 1) 2½ ft. long in the Madras Museum from Shankavaram in Cuddapah district schematically resembles a ram, it contained iron spearhead and huddled fragments of human and animal bones. Another sarcophagus (Pl. X, fig. 2), from Pallavarum in Chingleput district, resembles an elephant. A cylindrical sarcophagus (Wheeler, 1959, p. 154) was found at Maski. Megalithic culture represents a heterogeneous assemblage of funerary customs practised by the people of those times.

ANIMALS IN THE BUDDHIST AND PROTO-HISTORIC CULTURES (600 B.C.—400 A.D.)

In Northern India this culture has been identified at Taxila, Sarnath, Rajgir, Pataliputra. Recent excavations of Nagarjunakonda and Amaravati in Andhra Pradesh have also revealed the existence of this culture in the south. The excavations of Taxila (Nath, 1959, pp. 76-84) revealed the existence of humped cattle, buffalo, pig, ass and horse. The 1921-excavation at Sarnath (Nath, 1958, pp. 165-175) revealed the existence of humped cattle, buffalo, sheep, goat, elephant and hare; besides these, turtles (*Chitra indica* Gray), *Batagur baska* (Gray) and shells of money cowry (*Monetaria monata* Linn.), and the freshwater mussel (*Parreysia* sp.), are also represented (Pl. V). The characteristic animals of this culture are mainly represented by humped cattle, horse, elephant and the lion. The cow was held sacred and there is a fine representation of bull from an Aśoka column at Rampurva (300 B.C.) in Bihar. The Aśokan Lion Capital at Sarnath (C. 2nd cent. B.C.), the emblem of the modern Republic of India, has lively animals consisting of bull, elephant, horse and the lion around the pedestal, all of which are characteristic animals of the Buddhist culture. However, it is surprising to note that so far no bony remains of the lion have been found. The recent excavations at Nagarjunakonda have also revealed the existence of similar animals. Here both Buddhist and Brahmanical cultures survived side by side because the kings were patronising the Brahmanical and the queens the Buddhist culture. At Nagarjunakonda the descendants of Ikshvāku kings (200 A.D.) were sacrificing a number of animals as offerings to gods in the *yajñas* the most prominent of which was the horse sacrifice (Nath, 1966, p. 12) the so-called *aśvamedha yajñas*, which were performed by the kings to show their power and suzerainty. The actual remains of a horse have been recovered from the *aśvamedha* site of Nagarjunakonda recently is illustrated here (Pl. XI).

Thus from what has been discussed above we may conclude that animals were important in the early Indian cultural life playing a rôle in food economy as well as in the cultural and ritual practices.

REFERENCES

- Bose H. K., 1959. *Ancient India*, Delhi, No. 14, p. 42.
- Eapen, J., 1960. In: *From History to Prehistory at Nevasa*, 1954-56—Poona, pp. 531-536. (Univ. of Poona, Publ., No. 1).
- George, J. G., 1955. In: *Report of the excavation at Nasik and Jorwe*, 1950-51—Poona, pp. 142-43. (University of Poona).
- Nath, B., 1955. *Ancient India*, Delhi, Nos. 10 & 11, pp. 107-120.
- 1957. *Ancient India*, Delhi, No. 13, pp. 111-120.
- 1958. *J. Zool. Soc. India*, Calcutta, 10 (2), pp. 165-175.
- 1959. *J. Zool. Soc. India*, Calcutta, 11 (1), pp. 76-84.
- 1963. The Animal Remains from Rangpur: *Ancient India*, Delhi, Nos. 18 & 19, pp. 153-160.
- 1959. *Proc. 1st All India Cong. Zool.*, Part. 2., Jabalpur, pp. 1-14, 4 pls.
- 1966. *Proc. 2nd All India Cong. Zool.*, Part 2, Banaras, pp. 6-13, 3 pls.
- 1966. *Proc. Zool. Soc.*, Calcutta, 19, pp. 179-195.
- 1968. Animal Remains from Rupar and Bara sites, Ambala district, E. Punjab, India: *Bull. Indian Museum*, 3 (1 & 2), Calcutta, pp. 68-115, 8 pls.
- 1968. Advances in the Study of Prehistoric and Ancient Animal Remains in India: A Review. *Rec. Zool. Surv. India*, 61 (1 & 2), pp. 1-63, 5 pls.
- 1968. The Animal Remains from Brahamagiri: *Rec. Zool. Surv. India*, Calcutta, 61 (1 & 2) pp. 65-88, 4 pls.
- Piggot, S., 1950. *Prehistoric India*, 289 pp., 32 Figs. Harmondsworth, Middlesex, Great Britain. (Penguin Books).
- Prashad, B., 1936. *Mem. Archaeol. Surv. India*, Delhi, No. 51, 61 pp., 8 pls.
- Ray, H. C., 1960. Shell remains from Nevasa Excavation (Mollusca; Gastropoda and Bivalvia), pp. 539-550, 2 pls. In: (Ed. by H. D. Sankalia and S. B. Deo). *From History to Prehistory at Nevasa* 1954-56 (Uni. Poona Publ. No. 1).
- Sewell, R. B. S. and Guha, B. S., 1931. In: *Mohenjodaro and the Indus Civilization*—London, 2, pp. 649-673 (A. Probsthain).
- Wheeler, M., 1953. *The Indus Civilization*, xi—98, pp. 25 pls.—Cambridge (Camb. Univ. Press).
- 1959. *Early India and Pakistan*, 241 pp., 57 pls., London (Thames & Hudson).

MUSEOLOGICAL STUDIES IN HOLLAND WITH SPECIAL REFERENCE TO EDUCATIONAL PROGRAMMES IN THE NATIONAL MUSEUM OF ETHNOLOGY, LEIDEN

SIPRA NANDI

INTRODUCTION

THE Netherlands, the land of Frans Hals, Vermeer, Rembrandt and Van Gogh is not only renowned for these artists but also noted for preserving its rich culture in a great many variety of museums. The country is small but due to the enthusiasm and interest of its people the treasures of the country are opened to the public with modern techniques of display, and what is most interesting, its municipal museums, besides presenting the exquisite examples of earlier centuries, also acquaint the public with the trend and tendencies of modern art by displaying paintings, sculptures and artistic handicrafts.

In the second half of the 19th century, a number of municipal museums were established in several cities of the Netherlands, such as, Gemeentemuseum, Arnhem (1856), Museum Boymans, Rotterdam (1859), Alkmaar Stedelijk Museum (1861), Frans Hals Museum, Haarlem (1862), Stedelijk Museum De Lakenhal, Leiden (1869), Gemeentemuseum, the Hague (1871), Stedelijk Museum, Amsterdam (1895). It should be men-

tioned in this connection that the municipal museums in the Netherlands mainly grew out of the old collections belonging to the town or from large private collections. Besides, Societies and Foundations also established museums in provincial capitals like Utrecht, Leeuwarden, Groningen etc. These Societies were later divided into two parts: Society for upkeep and Society of Friends.

Apart from the Municipal museums there are several national museums comprising representative collections of exotic cultures of different countries or collections betraying some national character. Such museums are the Rijksmuseum voor Volkenkunde, Leiden (1837), considered as the first Scientific Ethnological museum of Europe comprising representative collection of Hindu-Javanese culture, antiquities from India, Ceylon and Tibet, South East Asia and artistic and ethnological specimens from the Far East, Middle East, America and South Pacific Area, the Rijksmuseum von Oudheden (Museum of Antiquities) (1820-1830), and the National Museum of Natural